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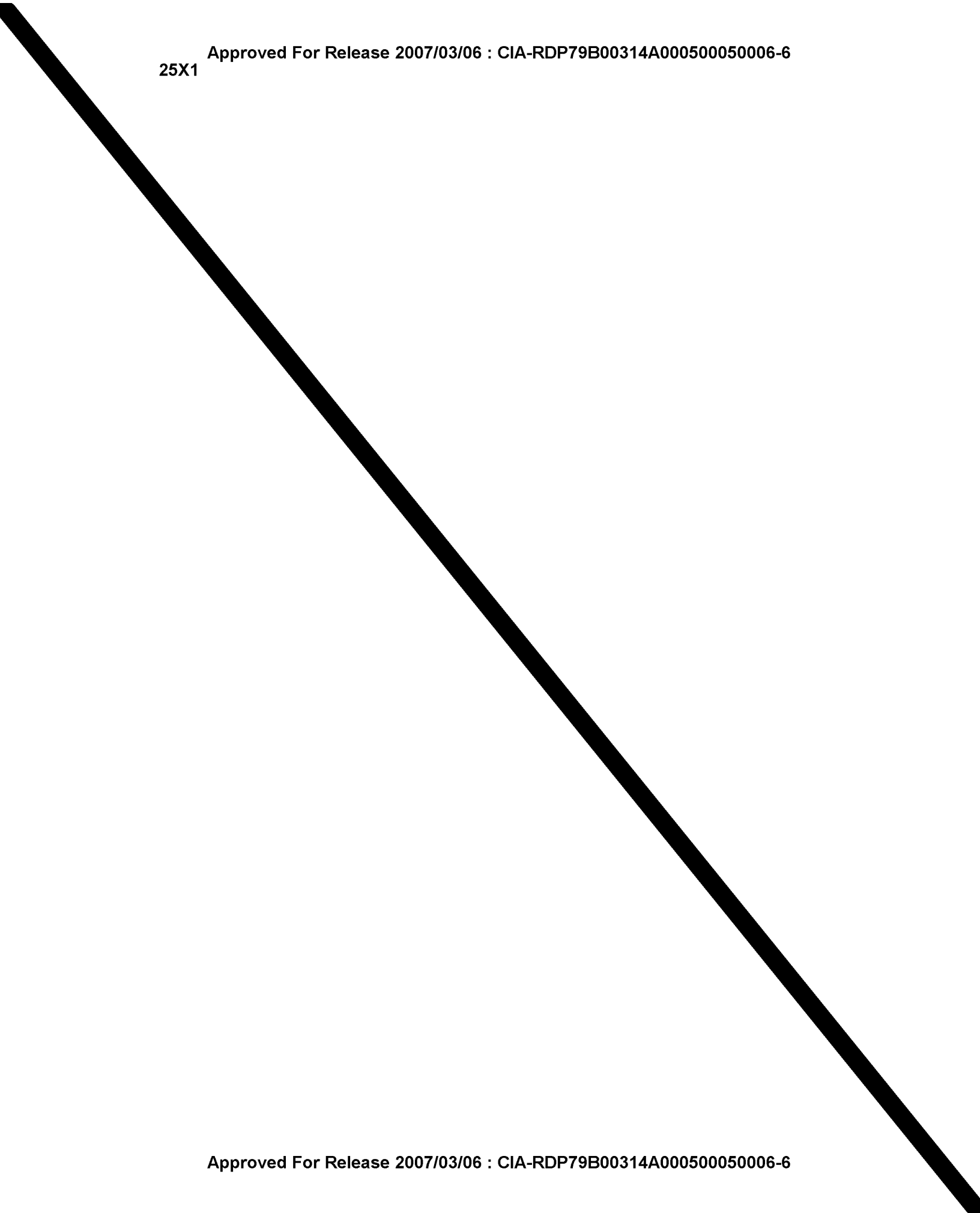

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DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE UNDER SECRETARY

20 APR 1964

MEMORANDUM FOR GENERAL GREER

SUBJECT: Probability Distribution of Camera Resolution

References: (a) Report of the Photo Working Panel on the C/M System, dtd 8 Feb 64

(b) (S)DNRO Memo for Directors, (S)NRO Program A and Program B, Subject: Report of the Photo Working Panel on the C/M System, dtd 2 Mar 64

The committee appointed to plan a specific program for implementation of reference (a) has submitted their recommendations. One of the recommendations suggests that a standard procedure for predicting camera resolution could be developed by determining the probability distribution of object modulation, the atmosphere, the optical transfer function, and image motion.

Attached is the committee's Work Statement that outlines a program to improve the accuracy and ease of predicting system performance. Perkin-Elmer has been active in this particular area. Accordingly, I desire that you request Perkin-Elmer to submit to you a proposal that encompasses the work outlined in the attached Work Statement. Your evaluation and recommendation of the resulting Perkin-Elmer proposal is to be forwarded as soon as practicable.

[redacted] 25X1 NRO

Brockway McMillan
Director
(S)National Reconnaissance Office

Attachment
Work Statement

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cc: Dr. Wheelon

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WORK STATEMENT

RESOLUTION PROBABILITY PROGRAM

OBJECTIVE

Improve the accuracy and ease with which predictions of system resolution and probability distribution can be made.

TASKS

The tasks are to include the following items:

a. Improve the Models of the Atmosphere

Atmosphere influences photography in frequency dependent (AC) and independent (DC) ways. Improvement of these models is necessary so that variations can be estimated with confidence. In the AC case, make a thorough survey of the published meteorological data and extend the analytical investigation of [redacted] et al. In the DC case, data being collected by Perkin-Elmer systems and other systems are to be analysed to determine the adequacy of the model suggested by the Photo Working Panel on the C/M system. 25X1

b. Improve the Models of Film Detectivity Limits

The exposure level, processing, and f/number affect the detectivity limit (AIM Curve) of film, therefore appropriate experiments and studies are to be undertaken to provide the useful probability distribution of this limit.

c. Improve the Ease of Calculating the Probability Distribution

Develop computer programs to simplify the calculations now done by extensive hand calculations.

d. Verification of Prediction Techniques

Using results of a, b, c above and data from well-measured and instrumented Perkin-Elmer systems, and others as appropriate, predict the distribution for a high performance system and compare the prediction with actual distribution. Analyse the differences and refine the prediction technique.

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